Date: October 26, 1998

To: OWP Professional Staff

Thru: E. H. Bartsch, P.E., Director
Office of Water Programs

From: Allen R. Hammer, P.E., Director
Division of Water Supply Engineering

Subject: Water-Policy-Technical Services-Contaminants-Methyl *Tertiary* Butyl Ether (MTBE)

Attached is a memorandum from Ram Tripathi, Ph.D., Toxic Substances Information. This memorandum describes the health effects of MTBE. Following discussions with, and upon the recommendation of Robert B. Stroube, M.D., M.P.H., Director of the Office of Epidemiology, the DWSE will be using 15 ppb as a trigger level for MTBE in public drinking water. This level **is not** a standard or an action level. It is a level at which we begin to more closely monitor the MTBE levels and provide increased technical assistance to the waterworks owner. Consistent with our existing practice, DWSE will continue to recommend that drinking water exhibiting taste and odors problems attributed to petroleum constituents, including MTBE, not be consumed. When this occurs, treatment or alternate sources of supply should be considered.

If you should encounter MTBE levels in excess of this trigger, or you have any MTBE questions, please contact the Technical Services Section of the DWSE.

Attachment

William R. Nelson, M.D., M.P.H.
Acting State Health Commissioner

October 2, 1998

MEMORANDUM

TO: Allen Hammer, Director
Division of Water Supply Engineering

FROM: Ram K. Tripathi, Ph.D., Toxicologist
Toxic Substances Information

SUBJECT: Health Risks of Methyl *Tertiary* Butyl Ether (MTBE) in Drinking Water

This is in response to your request regarding the health risks of MTBE in drinking water.

MTBE is a synthetic chemical with no natural sources. It is a blending component of gasoline and is used in reformulated gasoline (RFG) as an octane enhancer and to promote more complete burning, thereby reducing carbon monoxide and ozone levels in the air. The most common source of groundwater contamination by MTBE is leakage from underground storage tanks. Other potential point sources of contamination include: spills at gasoline stations; pipelines; landfill sites and dumps; at industrial and refueling facilities; and above ground storage tanks. Non-point sources include atmospheric deposition and storm water run-off.

MTBE is very soluble in water and is relatively mobile in soils, migrating rapidly to ground water. It generally migrates faster than other organic components of gasoline. As a result, MTBE can serve as an early indicator of potential gasoline contamination. MTBE has been detected in public and private drinking water wells. The reported concentrations of MTBE in wells can vary widely but generally are in the range of 1 to 10 parts per billion (ppb).

There are no studies on the effects on humans of drinking MTBE-contaminated water. In animal studies, health effects occur at high levels of exposure. Current animal studies indicate that MTBE has a low toxic potential. Based on these animal studies, maximum concentrations of MTBE in drinking water anticipated not to cause adverse health effects are determined to range from 700 to 14,000 ppb.

MTBE has a very unpleasant taste and odor (organolepetic properties) and these properties can make contaminated drinking water unacceptable to the public. Studies have been conducted on the concentrations of MTBE in drinking water at which individuals can detect the odor or taste of the chemical. Humans vary widely in the concentrations they are able to detect. Some individuals who are sensitive to MTBE can detect very low concentrations, while others do not taste or smell the chemical even at much higher concentrations. The odor and taste responses reported in observed individuals exposed to known concentrations of MTBE are in the 15 to 180 ppb range for odor and the 24 to 125 ppb range for taste. The Environmental Protection Agency has issued a drinking water advisory of 20 to 40 ppb on the basis of odor and taste thresholds. Several states have set their action levels (or remediation trigger level) for MTBE in the 15 to 250 ppb range.

In summary, based on the studies currently available in the scientific literature, most concentrations at which MTBE has been found in drinking water sources are unlikely to cause adverse health risks. The results of odor and taste threshold studies conducted in humans indicate that concentrations in the range of 15 to 40 ppb of water will likely trigger the unpleasant odor and taste effects. These concentrations are several folds lower than the range of exposure levels in which health risks were observed in animals.

I trust this information will be of help to you. If I can be of further assistance, please feel free to contact me.

RKT/br